

anti-malarial campaign, there were 1550! The report is illustrated with interesting plans and diagrams.

At Port Swettenham, Federated Malay States, anti-malarial measures were commenced in 1901 and 1902, and the latest report,¹ by Drs. Travers and Watson, shows how great a measure of success has been attained. Among the Government employees, for example, in 1901 236 sick certificates were issued and 1026 days of leave were granted on account of malaria. In 1905 the figures were respectively four and thirty. Comment is needless.

NOTES.

At a special general meeting of the Royal Society of Edinburgh, held on December 21, the council presented a report on the new accommodation to be provided for the society in consequence of its proposed removal from the Royal Institution, under the provisions of the National Galleries (Scotland) Bill. We learn from this report that in March last a memorial was presented to the Secretary for Scotland directing attention to the needs of the society, and asking for a free grant of 600*l.* a year. In a semi-official reply to this memorial the general secretary of the society was informed that a proposal was being entertained by the Government to devote the whole of the Royal Institution to the purposes of art, and that the Royal Society must contemplate the necessity for finding accommodation elsewhere. As it appeared from correspondence and an interview with the Secretary for Scotland that the Government had definitely decided to allot the whole of the Royal Institution for the purposes of art, the council resolved, with great reluctance, to accept the necessity for removal, and to do its best to secure adequate reinstatement. An accommodation committee was therefore appointed by the society to advise the Secretary for Scotland regarding sites and buildings suitable for new premises for the society, with the result that the committee unanimously recommended the building at present occupied by the Edinburgh Life Insurance Office, Nos. 22 and 24 George Street. At an interview on November 22 Mr. Sinclair offered, subject to the consent of Parliament, to purchase and adapt the George Street building on certain conditions, and in addition to give a free grant for the scientific purposes of the society. The conditions proposed were approved by the representatives of the society present as being, in the circumstances, an equitable settlement of the claims of the society. In a letter received by the general secretary, indicating the nature of the proposals which Mr. Sinclair intended to make in committee on the Bill in question, it was made clear that the society was to occupy the building on identical terms with those of the occupancy of the Royal Society at Burlington House. In the speech of the Secretary for Scotland on December 13, during the debate in Committee of the House of Commons on the Galleries Bill, the final proposals regarding the accommodation and grant to the society, recorded in last week's *NATURE* (p. 179) were described. Briefly, the arrangements are that a sum of 25,000*l.* will be used for the purchase of a building, and 3000*l.* to cover the expenses of fitting up, redecorating the new premises, and transferring the library and other effects of the society from the Royal Institution. The Treasury will also give the society a grant of not more than 600*l.* a year. The council expresses the opinion that these proposals meet the claims of the Royal Society both in respect of an additional grant and of reinstatement in suitable new premises. In conclusion, the council remarks

¹ *Journ. of Trop. Med.*, July 2.

in the report that the society owes a debt of gratitude to the Scottish Members of Parliament, to various members of the Royal Society of London, and to the British Science Guild for their loyal support in a time of difficulty. The report of the council was, on the motion of Sir William Turner, seconded by Prof. Bower, received and unanimously approved by the society at the special meeting on December 21.

THE death is announced of Dr. A. W. Panton, tutor and lecturer on mathematics at Trinity College, Dublin. Dr. Panton made several useful contributions to mathematical science, and was the author, in conjunction with his colleague, Prof. W. S. Burnside, of a standard work on "The Theory of Equations."

THE *Petit Parisien* recently invited its readers to vote on the question of the relative preeminence of great Frenchmen of the nineteenth century. The result is recorded in Monday's *Times*. Fifteen million answers were received; and Pasteur's name headed the list with 1,338,425 votes, Victor Hugo, in the second place, being more than one hundred thousand votes behind him. In addition to Pasteur, the following is the order of the names of men of science who appear among the first twenty in the list:—Prof. Curie; Dr. Roux; Parmentier, who introduced the potato into France; Ampère; Arago; and Chevreul, the chemist. It is clear from the results of this *plébiscite* that the French people cherish the memories of the scientific investigators whose work has contributed, not only to national renown, but also to the advancement of knowledge throughout the world.

REUTER reports the following severe earthquake shocks during the past few days:—*December 22, Kopal, Semirechensk*.—An extremely violent earthquake shock, lasting one and a half minutes, was felt in this district at 11.20 p.m. *Rome*.—The seismographic instruments at the observatories of Bologna and Florence recorded in the evening a violent earthquake estimated to have originated at a distance of 7000 kilometres. *December 26, Santiago de Chile*.—A strong shock of earthquake is reported from Arica. Shocks were felt at Iquique and Pisagua.

A REUTER message from Naples states that a portion of the crater of Vesuvius fell in on December 20, with the result that a shower of ash fell over Naples for twenty minutes so thickly as to obscure all view of the volcano. Later in the day the ash ceased to fall at Naples, but continued in the direction of Portici and Pompeii.

THE St. Petersburg correspondent of the *Globe* reports that an expedition for the exploration of the Arctic regions is being equipped under the leadership of Lieut.-Colonel Sergeyeff. The expedition will last for several years, and will start from Yeniseisk, and try to reach Bering Strait.

In the September number of *Terrestrial Magnetism* Prof. G. B. Rizzo states that on September 7, 1905, some hours before the Calabrian earthquake of last year, a land surveyor at Monteleone found the needle of his compass so much disturbed that he was compelled to discontinue work. In Japan great earthquakes have been known for some time to be preceded by magnetic disturbances, but we are not aware that any of these have been so large as that recorded by Prof. Rizzo.

THE annual conversazione of the Royal College of Science and Royal School of Mines Students' Union was held on December 19 at the College in Exhibition Road, South Kensington. There were exhibits and demonstrations

in mining and metallurgy, mechanics, geology, botany and zoology, and the Solar Physics Observatory was thrown open for inspection. Prof. W. Gowland gave an illustrated lecture on "Stonehenge," and two lantern lectures were given by Dr. W. J. S. Lockyer on "The Photography of Clouds and Lightning."

A TELEGRAPHIC message in the *Times* of December 17 announces that Prof. Koch, who has for some time been engaged in investigating the causes of sleeping sickness in German and British East Africa, has proved that atoxyl is an effectual remedy against the disease. The treatment is reported to have been successful in all cases which have so far been dealt with, and it now only remains to test the permanence of the cures effected. If this news proves to be true, Prof. Koch is to be congratulated on finding a cure for this deadly disease, which has already spread over the Congo Free State, has depopulated some of the most fertile districts of Uganda, and is threatening the Sudan on the north and Rhodesia on the south. It is, however, probably somewhat premature to speak of cures in a chronic disease such as this, which may run without treatment for several years. Nagana, which is closely related to sleeping sickness, is an acute disease in horses, killing them in three or four weeks. By giving the animals arsenic, however, they may be kept alive for a year or more. If one must wait a year to test the permanence of a cure by arsenic in an acute disease such as nagana, how much longer must one wait in such a slow, chronic disease as sleeping sickness, which may have a natural duration of years instead of weeks? Prof. Koch's preliminary report will be awaited with interest.

THE annual meeting of the Association of Economic Biologists will be held at Cambridge on January 9, 10, and 11. The laboratories in the pathological department of the University and the zoological laboratory will be thrown open for the occasion. On January 9 the president, Mr. F. V. Theobald, will deliver an address on sea fisheries. The following papers will be read during the meeting:—Red-water fever and allied diseases, Prof. Nuttall, F.R.S.; cereal breeding, H. R. Biffen; new hemipterous fruit pests in Britain, F. V. Theobald; *Intorno agli esperimenti contro la Mosca delle olive (Dacus oleae, Rossi)*, Prof. A. Berlese; on the American gooseberry-mildew, an epidemic fungus disease now invading Europe, E. S. Salmon; the successful extermination of the black currant gall-mite, W. E. Collinge; the geographical distribution, natural and artificial, of the principal rubber plants, W. G. Freeman; notes on insect pests in the British East African Protectorate, F. V. Theobald; the spruce-gall and larch-blight diseases caused by "Chermes" and suggestions for their prevention, E. R. Burdon; a description of an infectious disease occurring in hares, T. Strangeways; the blood changes in man caused by the presence of metazoan parasites, and their aid in diagnosis, E. G. Fearnside; on the use of an economic museum in the teaching of geography, W. G. Freeman.

A BILL has been deposited in Parliament to incorporate the Channel Tunnel Company, and to authorise the construction of works which shall form part of the scheme intended to connect England and France by means of a railway in tunnel under the English Channel. It is estimated that the scheme will involve a total outlay of 16,000,000*l.* Half that amount is to be raised in this country, and the remainder is promised in France as soon as the scheme shall have received Parliamentary sanction in England. It is proposed to construct two parallel

tunnels, the total length of which under the sea is to be twenty-four miles, and with the land approaches on either side thirty miles. The tunnels, each 18 feet in internal diameter, are to be driven from Dover to Sangatte throughout the whole distance in the grey Rouen chalk. Power for the electric motors which are to be employed in the tunnel traffic is to be obtained from large generating stations, which are likewise to supply the current required for lighting and the compressed air necessary for the purposes of ventilation.

No. 7 of vol. xvi. of the Proceedings of the Royal Physical Society of Edinburgh is devoted to the second part of Dr. T. Scott's catalogue of the crustaceans inhabiting the basin and estuary of the Forth, this portion dealing with the ostracods, copepods, and cirripedes.

To the November number of the *American Naturalist* Prof. H. F. Osborn contributes the first portion of an article on the causes of extinction of species in mammals, more especially the larger kinds. After referring to the views of Darwin, Wallace, and Lyell, the author discusses in turn the influence of changes in the shape of land-masses and their connections; of climatic changes, especially increasing cold and varying degrees of humidity; of changes in the flora of countries brought about by climatic alterations; and, finally, the effects of insect-life. The concluding portion of the paper must be awaited before a summary of the author's views can be given. In another article Dr. Raymond Pearl discusses variation in the number of seeds in the lotus, *Nelumbium luteum*, while in a third Messrs. J. A. Cushman and W. P. Henderson give the results of a preliminary study of the finer structure of the "test" of the fresh-water rhizopod *Arcella*.

IN the November issue of the *Quarterly Journal of Microscopical Science* Dr. Georgina Sweet continues her account of the anatomy of the marsupial mole (*Notoryctes typhlops*), dealing in this instance with the vestigial eye. This organ, despite the fact that its owner spends much of its time on or near the surface of the ground, is much more completely atrophied than in the mole, the optic nerve and lens being wanting, while the other structures connected with vision are degenerated in a greater or less degree. The eye itself has sunk deep beneath the skin, which passes over it unaltered except for the presence of sensory (? tactile) organs developed from the lachrymo-nasal glands and ducts. This complete degeneration of the eye may be attributed to the irritating effects of the particles of heated sand amid which the creature dwells, the development of the glandular structures into sense-organs being in all probability a compensation for the loss of vision.

AMONG other articles in the November issue of the *Quarterly Journal of Microscopical Science*, one, by Mr. F. A. Potts, is devoted to the modification in the sexual characters of hermit-crabs induced by the parasitic cirripede *Peltogaster*. Two articles, one by Mr. E. Potts, of Philadelphia, and the other by Mr. E. A. Browne, of University College, London, treat specially of the medusæ of the American fresh-water polyp *Microhydra*, with notes on the two other known forms of medusa-producing polyps. In a fourth article Mr. C. Shearer describes the structure of the nephridia of the annelid *Dinophilus*, which proved to be closed internally by "flame-cells," or "solenocytes," similar to those of certain polychæte annelids, the lancelet, and one form of the *Phoronis* larva. The two remaining articles deal respectively with the canker of apple trees and Dr. R. Goldschmidt's recent monograph on the lancelets of the genus *Amphioxides*.

THE report of the Board of Health on Plague in New South Wales in 1905 includes reports on the fifth outbreak of plague at Sydney, by Dr. Ashburton Thompson; on outbreaks of plague on the Clarence and Richmond Rivers, by Mr. R. J. Millard; on an outbreak of plague at Newcastle, by Mr. R. Dick; and appendices on the kind of printed forms used in investigating plague and on the epidemiology of plague, the latter being an address by Dr. Thompson. Again clear evidence is brought forward of the correlation between rat plague and human plague in the four localities of the outbreaks, and Dr. Thompson's address gives a valuable summary of the epidemiology of the disease. The report is illustrated with five maps and a chart.

THE last Bulletin of the Madras Museum, under the editorship of Mr. E. Thurston, contains an interesting monograph on the Paraiyan or Pariahs of southern India. The name of this caste seems to mean "drummers," and the Rev. A. C. Clayton, the author of the monograph, accepts the theory that they are a people who in former times were priests of the non-Aryan or Dravidian races, and that the detestation shown by the Brahmans to them is based on religious rivalry rather than on their foul course of life—the eating of carrion and the like. Mr. Clayton gives an interesting account of their religious rites, social and domestic ceremonies. These have clearly suffered much modification under the influence of their Hindu neighbours, and they now retain little that is really primitive. Thus they seem to have discarded the totemistic exogamous system of groups, and their religion has been largely influenced by Hinduism. This contribution to the ethnology of southern India gives a useful account of an interesting and little-known people.

PARTS i. and ii. of the fifth volume of *Biometrika* were issued together as a double number at the beginning of this month. The volume opens with a full and interesting memoir of the late Prof. Weldon, joint founder and co-editor of the journal, who died last spring at the early age of forty-six; many of our readers may be glad to note that this memoir is also obtainable separately from the Cambridge University Press. The following article is by Prof. Raymond Pearl, on the variation of *Chilomonas paramoecium* under favourable and unfavourable conditions; it is shown that the individuals under unfavourable conditions are smaller than the others and of somewhat different shape, and the relation of these facts to the theories of Driesch and others is discussed. The promised issue of the memoir by the same writer, on which some controversy recently took place in our correspondence columns, has, however, apparently been deferred to the next part. Dr. F. A. Woods and Mr. David Heron, in two independent articles, conclude that neither in man nor in the horse is there any significant inheritance of the sex-ratio, nor is there any evidence of Mendelian inheritance—important contributions to the literature of this subject. Dr. Macdonell contributes a second study of the English skull, based on crania discovered during excavations in Liverpool Street, and Prof. Pearson discusses the relations between intelligence and various physical and mental characters, all such relations appearing to be very light. The concluding article gives an account of an important investigation, by Dr. J. W. Jenkinson, on the relation between the first furrow, the sagittal plane, and the plane of symmetry in more than 800 frogs' eggs; the results of this investigation show that the conclusions of some previous writers, based on the examination of very inadequate numbers of eggs, have been stated much too

confidently, the variation exhibited being very large indeed. The miscellanea, as usual, contain a number of shorter articles, chiefly on minor points of statistical theory. We note that Dr. Macdonell, Mr. Elderton, and Prof. Pearl are now associated with Prof. Pearson in the editing of the journal, and it may be hoped that this assistance will lead to a more regular issue than in the past.

IN the second number of the Botanical Journal of the Imperial Society of Naturalists in St. Petersburg, Mr. and Mrs. B. Fedtschenko present an article collating the species of Campanulaceæ from Russian Turkestan. In the course of an article on the flora of a district in the Government of Riazan mention is made of the discovery of pollen and seed from pine trees in the peat that would indicate the previous extension of coniferous forests many miles further south. A description of plants newly recorded from the Crimea is contributed by Mr. A. Younghé.

ON the subject of cotton cultivation in the Bombay Presidency, Mr. F. Fletcher contributes an instructive article to the *Agricultural Journal of India*, vol. i., part iv. Premising that the better the quality the longer the cotton takes to mature, five regions are distinguished according to the nature of the soil and the amount of rainfall. Of these, the Surtee-Broach and Karnatak tracts are said to be capable of producing the best indigenous cottons, while on a portion of the Sind tract that is irrigated excellent Egyptian cotton has recently been grown. In the matter of new cottons a promising hybrid is announced from the Surat farm, and cautious but sanguine views are expressed with regard to tree cottons, of which two are discussed as forms of *Gossypium peruvianum* and *G. barbadense*.

AN interesting account giving practical details of the construction of a tramway in connection with the extraction of timber from the forests of Goalpara, in northern India, is furnished by Mr. W. F. Perrée to the September and October numbers of the *Indian Forester*. For working the forests in question, situated north of the Brahmaputra towards the Bhutan border, neither sufficient labour nor animals could be maintained; further, no water was available in parts of the district; for these and other reasons an experimental tramway was laid down, and subsequently extended for a distance of nine miles from the Brahmaputra. Short logs, sleepers, and water tanks are conveyed on single trucks, while large logs are placed on movable frames mounted on the trucks as bogies. The details of construction and cost provide useful items for reference.

DR. E. HOWARD ADYE, whose careful "Twentieth Century Atlas of Microscopical Petrography" has already been noticed in these pages, is now issuing in parts a work entitled "Studies in Micropetrography," accompanied by actual rock-sections, as well as coloured illustrations. A prospectus and sample plate can be obtained from the publisher, Mr. R. Sutton, 43 The Exchange, Southwark, S.E. The rock-sections are of the same beautiful character as those issued with the previous atlas, and the subscription price of 4l. 4s. for forty-eight of these and twelve parts of the work cannot be regarded as excessive. The plates and detailed descriptions should enable the student to go a very long way in self-instruction, while the series of preparations would be welcome in any laboratory. With a view to systematic arrangement later, we could have wished that the descriptions had been printed on separate and unpaginated sheets. The interesting volcanic ash of Mont Pelée is included in the first part issued. Surely, however, it would be possible for Dr. Adye to quote published litera-

ture concerning this material. He states that he has found none at present.

THE physical papers read at the seventy-eighth meeting of the German Association of Naturalists and Physicians are published in No. 20 of the *Verhandlungen* of the German Physical Society, and also in Nos. 21 and 22 of the *Physikalische Zeitschrift*. A striking case of "chemiluminescence" is described by Prof. E. Wedekind; the interaction of chloropicrin with magnesium phenyl bromide in ethereal solution is accompanied by the production of a green flame beneath the ether, without the latter, however, being caused to kindle or explode. In a dark room the luminescence appears very intense. An interesting lecture on the so-called "liquid crystals" was delivered by Prof. Lehmann at a general meeting of the association; its general scope was to illustrate how the development of such "crystals" appears to mimic the phenomena usually supposed to be characteristic of the simplest forms of living matter.

A COPY of a paper entitled "Niederschlag, Abfluss und Verdunstung auf dem Landflächen der Erde," prepared by Dr. Richard Fritzsche to attain his doctorate (Friedrichs Universität Halle-Wittenberg), has been received. The paper is an attempt to re-calculate from recent data the total yearly rainfall over the earth's surface, and to indicate the transference of water between land and sea. The flow of water through the world's rivers is, of course, also considered in detail, and in this connection a very full list of authorities and references is given, adding greatly to the value of the thesis. In most cases the figure used is compared with that given by Murray. The unit adopted is the cubic kilometre per year. The total rainfall over the whole world is given by Fritzsche as 465,300 cubic kilometres per year, which is equivalent to a uniform depth of 91 centimetres; Brückner gave 94 centimetres. The rain falling on land is estimated by Fritzsche as 111,940 cubic kilometres per year, by Brückner at 122,540 cubic kilometres, and by Murray at 122,318 cubic kilometres per year. The amount given by Fritzsche is equivalent to a depth of 75 centimetres. Considering only the land which is drained by rivers into the sea, it is calculated that only 30 per cent. of the water returns to the sea in this way, the remaining 70 per cent. being removed by evaporation. The tables which accompany the paper are very full and interesting.

SINCE the publication of the first edition of his "Sinnesorgane im Pflanzenreich zur Perception mechanischer Reize" (Leipzig: Engelmann) in 1901, Prof. G. Haberlandt has continued his investigations of the sense organs, or organs of perception, of plants, and he includes his new observations in the second edition of his work just published. The original volume was reviewed in NATURE of April 10, 1902 (vol. lxxv., p. 529).

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY, 1907:—

- Jan. 2. 7h. Neptune in opposition to the Sun.
3-4. Epoch of January Meteors (Boötids, radiant $230^{\circ} + 53^{\circ}$).
4. 6h. Venus at maximum brilliancy.
7. 9h. 56m. to 12h. 56m. Transit of Jupiter's Sat. III. (Ganymede).
9. 17h. 44m. to 18h. 20m. Moon occults γ Libræ (mag. 4.1).
10. 17h. 12m. Moon in conjunction with Venus. Venus $0^{\circ} 17' N$.
13. Total eclipse of Sun, invisible at Greenwich.
14. 13h. 13m. to 16h. 13m. Transit of Jupiter's Sat. III. (Ganymede).

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- Jan. 16. Venus. Illuminated portion of disc = 0.353.
17. 11h. 28m. Minimum of Algol (β Persei).
20. 8h. 17m. Minimum of Algol (β Persei).
21. 9h. 7m. to 10h. 12m. Moon occults ξ^2 Ceti (mag. 4.3).
24. Neptune $4^{\circ} N$. of 36 Geminorum (mag. 5.2).
26. 2h. 4m. Jupiter in conjunction with Moon. Jupiter $2^{\circ} 37' N$.
,, 6h. 40m. to 7h. 45m. Moon occults ν Geminorum (mag. 4.1).
28-29. Partial eclipse of Moon, invisible at Greenwich

COMETS 1906h (METCALF) AND 1906d (FINLAY).—FROM observations made at Mount Hamilton and Rome, Herr M. Ebell has calculated a set of elliptic elements for comet 1906h, after finding that the observed places could not be satisfied by a parabola. The time of perihelion passage, according to these elements, was October 10.794 (Berlin), and the period of the comet is 7.588 years. The elements exhibit a similarity to those of comets Faye, Wolf, 1892 V., 1896 V., and 1900 III., but it is improbable that comet 1906h is identical with any of these, although it probably belongs to the same family. An ephemeris extending to January 28 is also given by Herr Ebell, but, as the comet is so extremely faint, it is not worth while to reproduce it here.

On December 8 Prof. Hartwig, at the Bamberg Observatory, examined the neighbourhood of the comet, and of the star B.D.— $3^{\circ} 696$, with a 10-inch refractor, for the nebulous objects seen at Bordeaux on November 22, but was unable to find them (*Astronomische Nachrichten*, No. 4141).

An ephemeris extending to March 22 is given for comet 1906d in No. 4140 of the *Astronomische Nachrichten* by M. L. Schulhof. This object is now very faint, and is about $1\frac{1}{2}^{\circ}$ south of Pollux.

TWO STARS WITH A COMMON PROPER MOTION.—In vol. lx. of the Monthly Notices of the Royal Astronomical Society, Mr. Bellamy announced that the two stars AG Berlin B 5072-5073 have a common proper motion, and this was confirmed later by Prof. Kreutz. Additional confirmation now comes from Prof. Millosevich, who has compared the available observations since the year 1881 with more recent ones, the last of which was made at Rome at the epoch 1906.39, and finds the proper motion on a great circle to be $1''.385$ in the direction $142^{\circ} 7'$ (*Astronomische Nachrichten*, No. 4132).

OBSERVATIONS OF VENUS.—Continuing his articles on "Planets and Planetary Observation" in the *Observatory*, Mr. Denning discusses the observation of Venus in No. 377, and points out that the difficulties attending such observations have hitherto prevented any final determination of the planet's rotation period, or of the nature of her surface markings.

He also states that the best times to observe the planet are during the evening apparitions in the early part of the year and the morning apparitions which occur in the latter half of each year, when Venus is above the horizon for a long time after sunset or before sunrise. The chief observations of reputed surface markings which have been made since the time of Galileo are discussed at some length in Mr. Denning's notes.

A BRILLIANT METEOR.—Mr. H. E. Wood, of the Government Observatory, Johannesburg, records, in No. 4141 of the *Astronomische Nachrichten*, the observation of a brilliant meteor on July 16 in various parts of South Africa. An observer at Mbabane, in Swaziland, describes the object as a large white ball with a long trail of sparks, and states that it split into two masses each larger than the full moon, whilst a loud explosion accompanied its disappearance. Attempts to locate the object, which apparently struck the earth near to Mbabane, have been unsuccessful. Mr. Wood himself saw a meteor, which he believes to have been the same object, at Johannesburg, two hundred miles away, at 8h. 45m. p.m. (standard time of $30^{\circ} E$.), but he heard no detonation, although the object was very brilliant and left a trail of sparks. As a similar body was observed in Germany on the same evening, Mr. Wood suggests that possibly the earth encountered a stream of meteoric bodies on July 16, and that both the observed meteors were members of the same stream.